

## Section 3-4: Equations of Lines

By the end of this lesson, you should be able to answer:

- How do you write an equation of a line given information about the graph?
- How do you solve problems by writing equations?

Define the following:

1. Slope-intercept Form

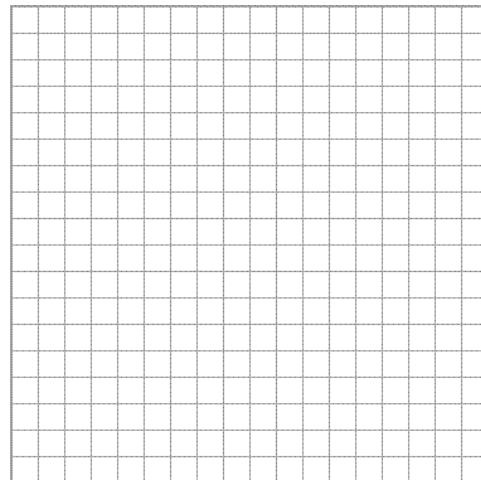
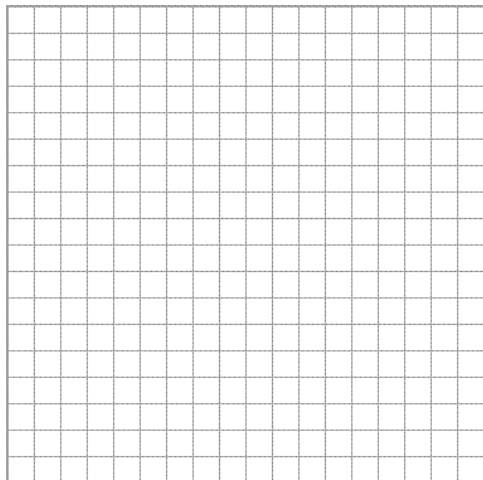
2. Point-slope Form

In the slope-intercept form, we have two things given to us: the \_\_\_\_\_ and the \_\_\_\_\_. These are the only two things we need to put an equation in the slope-intercept form, and this is also where it got its name from. In the slope-intercept form,  $m$  stands for \_\_\_\_\_ and  $b$  gives the y-coordinate of the \_\_\_\_\_.

*Example 1:* Identify the slope and y-intercept for each line and graph the lines on the same set of axes.

a.  $y = \frac{1}{2}x$

b.  $2y - x = -6$



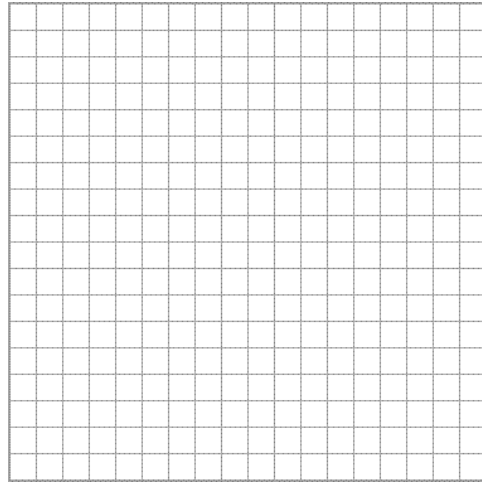
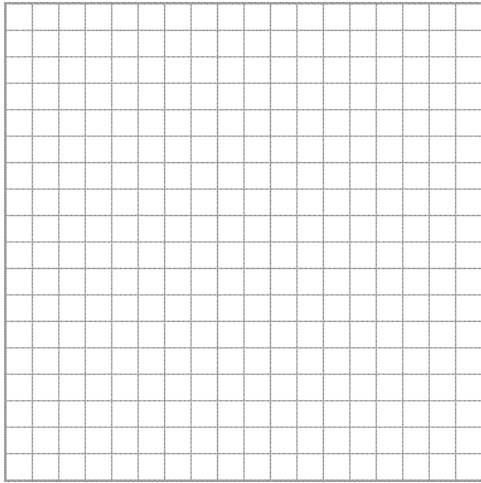
To use the slope-intercept form, you need to have the slope and the  $y$ -intercept. If you have any point other than the  $y$ -intercept, then you cannot just plug in for  $b$ . You will need to either use the slope-intercept form to find  $b$  (which takes quite a bit of time), or you could use the point-slope form. It is called point-slope because

the two things you need to use this are a \_\_\_\_\_ and the \_\_\_\_\_.

*Example 2:* Write the equation of the line from the given information, choosing which form you would need before you begin. Then graph the line.

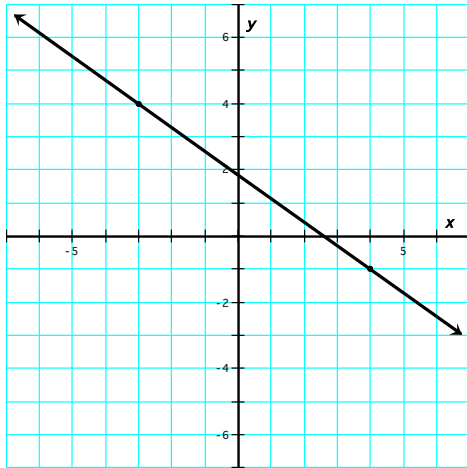
a.  $m = -2$ ,  $(0, 4)$

b.  $m = 3/4$ ,  $(8, -2)$

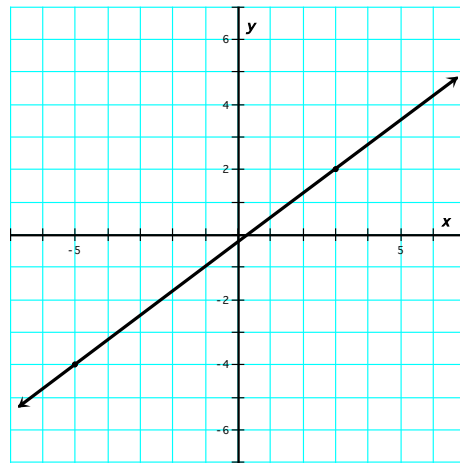


*Example 3:* Write the equation for each line.

a.



b.



Problem Set:

"We can have facts without thinking but we cannot have thinking without facts." - John Dewey